Photodegradation of p-cresol in aqueous Mn(1%) doped zinc oxide suspension.

ABSTRACT

Photodegradation of p-cresol was carried out by a 1.0wt% Mn doped ZnO under visible light irradiation. The amount of photocatalyst, concentration of p-cresol and pH were studied as variables. The residue of p-cresol and mineralisation was measured using a UV-visible spectrophotometer and TOC analyzer, respectively. The intermediate was detected by UPLC. The results showed the amount of photocatalyst and concentration of p-cresol was 1.5g/L and 35 ppm respectively. P-cresol photodegradation was favorable in the pH 6-9 range. The detected intermediate was 4-hydroxy-benzaldehyde. TOC studies show that 74% of total organic carbon was removed from solution during irradiation time. Reusability shows no significant reduction in photocatalytic performance in photodegrading p-cresol. This study indicates that 1.0 wt% Mn doped ZnO can remove p-cresol from wastewater under visible light irradiation, and being more economic than UV irradiation could be applied on an industrial scale.

Keyword: Photodegradation; P-cresol; Mn-doped ZnO.